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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 18/822,013	Applicant(s) MUTHU et al.	
	Examiner PAN CHOY	Art Unit 3624	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 5 February 2026.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Introduction

2. The following is a **final** Office Action in response to Applicant's communications received on February 5, 2026. Claims 1-9, 13-14 and 16-20 have been amended.

Currently claims 1-20 are pending, claims 1, 9 and 17 are independent.

Response to Amendments

3. Applicant's amendments necessitated the new ground(s) of rejection in this Office Action.

4. Applicant's amendments to claims 1-9, 13-14 and 16-20 are **NOT sufficient to overcome the 35 U.S.C. § 101 rejection** as set forth in the previous Office Action. Therefore, the 35 U.S.C. § 101 rejection to claims 1-20 has been maintained.

Response to Arguments

5. Applicant's arguments filed on February 5, 2026 have been fully considered but they are not persuasive.

6. In the Remarks on page 9, Applicant's arguments regarding the 35 U.S.C. § 101 rejection that the elements involve processing data with a machine learning model and training a neural database necessarily require a machine to perform certain steps, and cannot reasonably be characterized as an activity that falls within enumerated sub-groupings of fundamental economic principles or practices, commercial or legal integrations, and managing personal behavior and relationships or interactions between people.

In response to Applicant's arguments, the Examiner respectfully disagrees. A claim recites an abstract idea that falls within the certain methods of organizing human activity does not mean a machine is not required. However, conventional computer components operating to collect, manipulate, and display data are well understood, routine, and conventional to a skilled artisan. *See Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1324–25 (Fed. Cir. 2016) (generic computer components, such as an "interface," "network," and "database," fail to satisfy the inventive concept requirement); *Alice*, 573 U.S. at 226 ("Nearly every computer will include a 'communications controller' and [a] 'data storage unit' capable of performing the basic calculation, storage, and transmission functions required by the method claims."); *Intellectual Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315, 1327 (Fed. Cir. 2017) (explaining that receiving a request to execute a database search and delivering records are routine computer functions that can only be described as generic or conventional); *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1355 (Fed. Cir. 2014) ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive.").

7. In the Remarks on page 10, Applicant's arguments regarding the 35 U.S.C. § 101 rejection that the amended language of Claim 1 clarifies how at least the additional elements of "*processing the structured entity data* with the *machine learning model* to generate metadata associated with the structured entity data, the metadata to be used to augment training data for a

neutrality database" and "*augmenting the structured entity data* with the metadata associated with the structured entity data to *generate augmented training data*" meaningfully limit the alleged abstract idea to a particular solution, which improves the training of a neural database for entity matching by conferring the beneficial technical effect [as] described. Thus, the claim as a whole integrate the alleged abstract idea into a practical application, transforming the claim into patent-eligible subject matter under Step 2A, Prong Two

In response to Applicant's arguments, the Examiner respectfully disagrees. In order for a claim to integrate the exception into a practical application, the additional claimed elements must, for example, improve the functioning of a computer or any other technology or technical field (*see* MPEP § 2106.05(a)), apply the judicial exception with a particular machine (*see* MPEP § 2106.05(b)), affect a transformation or reduction of a particular article to a different state or thing (*see* MPEP § 2106.05(c)), or apply or use the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment (*see* MPEP § 2106.05(e)). *See* Revised 2019 Guidance.

The amended language of Claim 1 "processing the structured entity data with the machine learning model to generate metadata associated with the structured entity data, the metadata to be used to augment training data for a neutrality database" and "augmenting the structured entity data with the metadata associated with the structured entity data to generate augmented training data", which is a form of information processing, and therefore, "a fundamental building block of human ingenuity". As such it is an abstract idea.

Here, the claim recites "with the machine learning model" is merely adding the words "apply it" or using "a particular machine" with an abstract idea, or mere instructions to implement the abstract idea on a computer. The Supreme Court has repeatedly made clear that merely limiting the field of use of the abstract idea to a particular existing technological environment does not render the claims any less abstract. *See Affinity Labs of Texas, LLC v. DirecTV, LLC,* 838 F.3d 1253, 1258 (Fed. Cir. 2016). As to learning per se, such an argument overlooks the entire education system. Reciting machine learning is placing such learning in a computer context, offering no technological implementation details beyond the conceptual idea to use a machine for learning. Further, training a neural database is no more than training a generic model using a collection of functions and data by a user in some unspecified way without

any technological implementation details of the process fails to reflect any functioning improvement to the computer itself or other technology. The claim does not recite an improved way to train a machine learning model and does not purport to improve machine learning using training data. *See Intellectual Ventures,* 792 F.3d at 1371.

Thus, the claims as a whole, nothing in the claim elements reflects an improvement to the functioning of a computer itself or other technology. They do not implement the abstract idea in conjunction with a particular machine or manufacture that is integral to the claim. They do not transform or reduce a particular article to a different state or thing. They do not apply the abstract idea in a meaningful way beyond merely linking it to a particular technological environment. *See* Revised Guidance, 84 Fed. Reg. at 55 and MPEP sections cited therein. Therefore, no additional element in the claims that integrates the judicial exception into a practical application.

8. In the Remarks on page 11, Applicant argues that the Office action has not made a *prima facie* showing of how *Miller, Noyes,* and *Jackson,* either individually or in any combination thereof, explicitly disclose, implicitly teach, or other suggest each and every element and limitation of independent claim 1 (and similarly, of claims 9 and 17). For example, the cited paragraphs of Miller do not teach "training the neural database based on the augmented structure entity data to predict one or more second entities that supply materials for the first entity and associated with the good or the service," as recited in Claim 1.

In response to Applicant's arguments, the Examiner respectfully disagrees. As can be seen in the previous Office Action, the Examiner has set forth in the Office Action by clearly pointed out the paragraph number of the cited references for the teaching of each limitation as claimed, clearly pointed out the difference(s) in the claims, and explained why the claimed invention would have been obvious to one of ordinary skill in the art at the time the invention was made by combining the references, which satisfied the requirements for the 35 U.S.C. § 103 rejection. See **MPEP 706/02(j)**. The Federal Circuit has repeatedly noted that "the prima facie case is merely a procedural device that enables an appropriate shift of the burden of production." *Hyatt v. Dudas,*

492 F.3d. 1365, 1369 (Fed. Cir. 2007) (citing *In re Oetiker,* 977 F.2d 1443, 1445 (Fed. Cir. 1992)). The Court has held that the USPTO carries its procedural burden of establishing a prima facie case when its rejection satisfies the requirements of 35 U.S.C. § 132 by notifying the applicant of the reasons for rejection, "together with such information and references as may be useful in judging of the propriety of continuing the prosecution of [the] application." *In re Jung,* 637 F.3d 1356, 1362 (Fed. Cir. 2011) (citation omitted). All that is required of the Office is to set forth the statutory basis of the rejection, as well as any reference on which the rejection relies, in a sufficiently articulate and informative manner as to meet the notice requirement of § 132. *Id.* at 1363; *see also Chester* v. *Miller,* 906 F.2d 1574, 1578 (Fed. Cir. 1990) ("Section 132 is violated when the rejection is so uninformative that it prevents the applicant from recognizing and seeking to counter the grounds for rejection."). Therefore, the Examiner respectfully submits that the forego reasons satisfied the requirements for establishing a *prima facie* case under 35 U.S.C. § 132.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. **Claims 1-20** are rejected under 35 U.S.C. 101 because the claimed invention is directed to an abstract idea without significantly more.

As per Step 1 of the subject matter eligibility analysis, it is to determine whether the claim is directed to one of the four statutory categories of invention, i.e., process, machine, manufacture, or composition of matter.

In this case, claims 1-8 and 17-20 are directed to methods of training a neural database without tied to a particular machine for performing the steps, which falls outside of the four statutory categories. However, claims 1-8 and 17-20 will be included in Step 2 Analysis for the purpose of compact prosecution. Claims 9-16 are directed to a system comprising a memory and a processor, which falls within the statutory category of a machine.

With respect to claims 1-8 and 17-20, the claims are directed to non-statutory subject matter because the claims are directed to methods **without tied to a particular machine** in the body of the claims for performing the steps. One factor to consider when determining whether a claim recites a §101 patent eligible process is to determine if the claimed process (1) is tied to a particular machine or; (2) transforms a particular article to a different state or thing. See *In re Bilski*, 545 F.3d 943, 88 USPQ2d 1385 (Fed. Cir. 2008) (en banc) *aff'd, Bilski v. Kappos*, 561 U.S. ___, 130 S.Ct. 3218, 95 USPQ2d 1001 (U.S. 2010). (Machine-or-Transformation Test).

In Step 2A of the subject matter eligibility analysis, it is to "determine whether the claim at issue is directed to a judicial exception (i.e., an abstract idea, a law of nature, or a natural phenomenon). Under this step, a two-prong inquiry will be performed to determine if the claim recites a judicial exception (an abstract idea enumerated in the 2019 Guidance), then determine if the claim recites additional elements that integrate the exception into a practical application of the exception. *See* 2019 Revised Patent Subject Matter Eligibility Guidance (2019 Guidance), 84 Fed. Reg. 50, 54-55 (January 7, 2019).

In Prong One, it is to determine if the claim recites a judicial exception (an abstract idea enumerated in the 2019 Guidance, a law of nature, or a natural phenomenon).

Taking claim 1 as representative, the claim recites the limitations of "extracting entity data related to a first entity that provides a good or a service, transforming the entity data into structured entity data, processing the structured entity data with the machine learning model to generate metadata associated with the structured entity data, augmenting the structured entity data with the metadata, training the neural database based on the augmented structured entity data to predict one or more second entities that supply material for the first entity"; dependent claims 2-8 further characterizing the limitations of claim 1 and recite the functions "determining a weighted sum of a frequency score and a criticality score for each material, performing reinforcement learning to refine the neural database, and processing a user query with the trained neural database to generate one or more query results". None of the limitations recites technological implementation details for any of these steps, but instead recite only results desired by any and all possible means. The limitations, as drafted, are methods that allow user to manage sales activities (e.g., procurement transactions) and manage interactions (e.g., one or more second entities that supply materials to the first entity), which falls in the certain method of organizing human activity grouping (including fundamental economic practices, commercial interaction and managing interactions between people). Even through claim 1 recites "processed by a machine learning model, but this machine learning model merely provides a technological environment and/or field of use for implementing the abstract idea. "The Supreme Court has repeatedly made clear that merely limiting the field of use of the abstract idea to a particular existing technological environment does not render the claims any less abstract." *Affinity Labs of Texas, LLC v. DirecTV, LLC,* 838 F.3d 1253, 1258 (Fed. Cir. 2016). As to learning/training per se, such an argument overlooks the entire education system. Reciting machine learning is placing such learning in a computer context, offering no technological implementation details beyond the conceptual idea to use a machine for learning. Thus, the mere nominal recitation of "by a machine learning model" and "a neural database" do not take the claim out of the certain methods of organizing human activity grouping. See Under the 2019 Guidance, 84 Fed. Reg. 52. Accordingly, the claims recite an abstract idea, and the analysis is proceeding to Prong Two.

In Prong Two, it is to determine if the claim recites *additional elements* that integrate the exception into a practical application of the exception.

Beyond the abstract idea, claim 1 recites no additional element for performing the steps, when given the broadest reasonable interpretation, a machine is not required in the claim. Even if claim 1 recites the additional elements of "a memory" and "a processor" as recited in claim 9 for performing the steps. The specification discloses these additional elements at a high level of generality and merely invoked as tools to perform the generic computer functions including receive interaction data over a network. For example, the specification discloses "Process(s) 702 are generally configured to retrieve and execute instructions stored in one or more memories, including local memories like computer-readable medium 712, as well as remote memories and data stores. Similarly, processor(s) 702 are configured to store application date residing in local memories; configured to transmit programming instructions and application data among the processor(s)." See ¶ 88. When given the broadest reasonable interpretation and in light of the Specification, these additional elements are no more than generic computer components and amount to no more than adding the words "apply it" or using "a particular machine" with an abstract idea, or mere instructions to implement the abstract idea on a computer. Thus, merely adding a generic computer, generic computer components, or programmed computer to perform generic computer functions does not automatically overcome an eligibility rejection. *Alice Corp. Pty. Ltd. V. CLS Bank Int'l,* 134 S. Ct. 2347, 2358-59, 110 USPQ2d 1976, 1983-84 (2014); *see also Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Canada (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) (A computer "employed only for its most basic function . . . does not impose meaningful limits on the scope of those claims."). The Federal Circuit has also indicated that mere automation of manual processes or increasing the speed of a process where these purported improvements come solely from the capabilities of a general-purpose computer are not sufficient to show an improvement in computer-functionality. *FairWarning IP, LLC v. Iatric Sys.*, 839 F.3d 1089, 1095, 120 USPQ2d 1293, 1296 (Fed. Cir. 2016). However, simply implementing the abstract idea on a generic computer does not integrate the abstract idea into a practical application because it does not impose any meaningful limits on practicing the abstract idea. Further, nothing in the claims that reflects an improvement to the functioning of a computer itself or another technology. Therefore, the additional elements do not integrate the judicial exception into a practical application. The claims are directed to an abstract idea, the analysis is proceeding to Step 2B.

In Step 2B of *Alice,* it is "a search for an 'inventive concept'—i.e., an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept' itself.'" *Id.* (alternation in original) (*quoting Mayo Collaborative Servs. v. Prometheus Labs., Inc.,* 132 S. Ct. 1289, 1294 (2012)).

The claims as described in Prong Two above, nothing in the claims that integrates the abstract idea into a practical application. The same analysis applies here in Step 2B.

Beyond the abstract idea, claim 1 recites no additional element for performing the steps, when given the broadest reasonable interpretation, a machine is not required in the claim. Even if claim 1 recites the additional elements of "a memory" and "a processor" as recited in claim 9 for performing the steps. The specification discloses these additional elements at a high level of generality and merely invoked as tools to perform the generic computer functions including receive interaction data over a network. For example, the specification discloses "Process(s) 702 are generally configured to retrieve and execute instructions stored in one or more memories, including local memories like computer-readable medium 712, as well as remote memories and data stores. Similarly, processor(s) 702 are configured to store application date residing in local memories; configured to transmit programming instructions and application data among the processor(s)." See ¶ 88. When given the broadest reasonable interpretation and in light of the Specification, these additional elements are no more than generic computer components for performing generic computer functions including receiving, manipulating, and transmitting information over a network. However, generic computer for performing generic computer functions have been recognized by the courts as merely well-understood, routine, and conventional functions of generic computers. See MPEP 2106.05 (d) (II) (Receiving or transmitting data over a network, e.g., using the Internet to gather data, *Symantec,* 838 F.3d at 1321, 120 USPQ2d at 1362 (utilizing an intermediary computer to forward information); *buySAFE, Inc. v. Google, Inc.,* 765 F.3d 1350, 1355, 112 USPQ2d 1093, 1096 (Fed. Cir. 2014) (computer receives and sends information over a network); Storing and retrieving information in memory, *Versata Dev. Group, Inc. v. SAP Am., Inc.,* 793 F.3d 1306, 1334, 115 USPQ2d 1681, 1701 (Fed. Cir. 2015); *OIP Techs.,* 788 F.3d at 1363, 115 USPQ2d at 1092-93). Thus, simply implementing the abstract idea on a generic computer for performing generic computer functions do not amount to significantly more than the abstract idea. (MPEP 2106.05(a)-(c), (e-f) & (h)).

For the foregoing reasons, claims 1-8 cover subject matter that is judicially-excepted from patent eligibility under § 101 as discussed above, the other claims 9-16 and 17-20 parallel claims 1-8—similarly cover claimed subject matter that is judicially excepted from patent eligibility under § 101.

Therefore, the claims as a whole, viewed individually and as a combination, do not provide meaningful limitations to transform the abstract idea into a patent eligible application of the abstract idea such that the claims amount to significantly more than the abstract idea itself. The claims are not patent eligible.

Claim Rejections - 35 USC § 103

11. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

12. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

13. **Claims 1-5, 7-13 and 15-20** are rejected under 35 U.S.C. 103 as being unpatentable over Miller et al., (US 2022/0253871, hereinafter: Miller), and in view of Noyes et al., (US 2018/0096365, hereinafter: Noyes), and further in view of Jackson, (US 2019/0259041), and Tangari et al., (US 2024/0061833, hereinafter: Tangari).

Regarding claim 1, Miller discloses a computer-implemented method of training a neural database for entity matching, comprising:

extracting, from an electronic data repository, entity data related to a first entity that provides a good or a service (see ¶ 210, ¶ 354-356, ¶ 415);

transforming the entity data into structured entity data configured to be processed by a machine learning model (see ¶ 54, ¶ 273);

processing the structured entity data with the machine learning model to generate metadata associated with the structured entity data (see ¶ 12, ¶ 54, ¶ 160-161, ¶ 167), the metadata to be used to augment training data for a neural database.

Miller discloses processing the large amounts of data associated with a worldwide collection of product-related records associated with different entities (see ¶ 13).

Miller does not explicitly disclose a first entity and a second entity; however, Noyes in an analogous for identifying consumers associated with behavior data discloses

data includes first data received from a first plurality of entities of a first community and second data received from a second plurality of entities of a second community (see ¶ 14).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Miller discloses augmenting DOCI information via data augmentation algorithm(s) (see ¶ 203, ¶ 267).

Miller does not explicitly disclose the following limitations; however, Jackson in an analogous art for managing dataset relationships discloses

augmenting the structured entity data with the metadata associated with the structured entity data to generate augmented trained data (see ¶ 11-13, ¶ 55, ¶ 124, claim 18).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes to include teaching of Jackson in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more optimal solution, in turn of operational efficiency. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Miller discloses training a neural network (NN) using a specialized training dataset corresponding to the type of specialized corpora product-related/relevant information to generate alternative queries from queries (or perform such tasks); and the NNs has exhibit significant language processing capabilities, similar to any of the performance characteristics known with respect to learning neural network system, self-training with task augmentation for better few-short learning (see ¶ 116, ¶ 169-171).

Miller, Noyes and Jackson does not explicitly disclose the following limitations; however, Tangari in an analogous art for augmenting training data discloses

the metadata to be used to augment training data for a neural database (see Abstract; ¶ 2, ¶ 7-9, claims 1 and 15);

training the neural database based on the augmented training data, the neural database comprising a neural network (NN)-based system that is trained to retrieve a predicted list of one or more second entities that supply materials for the first entity and associated with the good or the service (see ¶ 13, ¶ 32, ¶ 132, ¶ 158, ¶ 171-73, claims 7-8).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes and Jackson to include teaching of Tangari in order to gain the commonly understood benefit of such adaption, such as providing the benefit of additional of data analysis, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

In addition, phrase(s) of "the metadata to be used to augment training data for a neural database" the use of the metadata is directed to intended use language and is not given patentable weight. If Applicant desires to given the functional phrase(s) a greater patentable weight, the Examiner respectfully recommends Applicant to positively recite the function in the claim.

Regarding claim 2, Miller discloses the element set comprises one or more expected attribute-value pairs based on document structure (see ¶ 121, ¶ 208).

Miller does not explicitly disclose the following limitations; however, Noyes discloses the computer-implemented method of Claim 1, wherein:

the structured entity data comprises a plurality of key and value pairs associated with the first entity, at least one of the plurality of key and value pairs comprises an entity name, and at least one of the plurality of key and value pairs comprises the good or the service provided by the first entity (see ¶ 87, ¶ 165-166). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 3, Miller does not explicitly disclose the following limitations; however, Noyes discloses the computer-implemented method of Claim 2, wherein the metadata associated with the structured entity data comprises a plurality of key and value pairs associated with the materials associated with the good or the service provided by the first entity (see ¶ 15, ¶ 87). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 4, Miller discloses ranking the results based on the number of matching terms, frequency of matching terms and the assigned weight of the matching term; and a weighting factor applied for frequency of occurrences (see ¶ 187, ¶ 289, ¶ 414).

Miller does not explicitly disclose the following limitations; however, Noyes discloses the computer-implemented method of Claim 3, further comprising scoring each respective key and value pair of the plurality of key and value pairs associated with the materials based on one or more of:

a frequency with which the first entity obtains each material of the materials (see ¶ 60-61, ¶ 166-168, ¶ 174-175); or

a criticality of each material of the materials to the first entity for providing the good or the service.

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 5, Miller does not explicitly disclose the following limitations; however, Noyes discloses the computer-implemented method of Claim 4, wherein scoring each respective key and value pair is further based on a preference derived from one or more of historical data or user settings (see ¶ 40, ¶ 51-52, ¶ 181). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 7, Miller discloses the computer-implemented method of Claim 1, further comprising: performing reinforcement learning to refine the neural database, wherein the reinforcement learning is based on a user interaction with a query result generated by the neural database (see ¶ 161-162, ¶ 383).

Regarding claim 8, Miller discloses the computer-implemented method of Claim 1, further comprising: processing a user query with the trained neural database to generate one or more query results, wherein the one or more query results relate to the predicted list of the one or more second entities that supply the materials associated with the good or the service provided by the first entity (see Abstract; ¶ 84, ¶ 118, ¶ 121, ¶ 124).

Regarding claim 9, Miller discloses a processing system, comprising:

a memory comprising computer-executable instructions (see ¶ 45, ¶ 63, claim 1); and

a processor configured to execute the computer-executable instructions and cause the processing system (see ¶ 45, ¶ 63, claim 1) to:

extract, from an electronic data repository, entity data related to a first entity that provides a good or a service (see ¶ 210, ¶ 354, ¶ 415);

transform the entity data into structured entity data configured to be processed by a machine learning model (see ¶ 54, ¶ 273);

process the structured entity data with the machine learning model to generate metadata associated with the structured entity data (see ¶ 54, ¶ 160-161, ¶ 167), the metadata to be used to augment training data for a neural database.

Miller discloses processing the large amounts of data associated with a worldwide collection of product-related records associated with different entities (see ¶ 13).

Miller does not explicitly disclose a first entity and a second entity; however, Noyes in an analogous for identifying consumers associated with behavior data discloses

data includes first data received from a first plurality of entities of a first community and second data received from a second plurality of entities of a second community (see ¶ 14).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Miller discloses augmenting DOCI information via data augmentation algorithm(s) (see ¶ 203, ¶ 267).

Miller does not explicitly disclose the following limitations; however, Jackson in an analogous art for managing dataset relationships discloses

augment the structured entity data with the metadata associated with the structured entity data to generate augmented training data (see ¶ 11-13, ¶ 55, ¶ 124).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes to include teaching of Jackson in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more optimal solution, in turn of operational efficiency. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Miller discloses training a neural network (NN) using a specialized training dataset corresponding to the type of specialized corpora product-related/relevant information to generate

alternative queries from queries (or perform such tasks); and the NNs has exhibit significant language processing capabilities, similar to any of the performance characteristics known with respect to learning neural network system, self-training with task augmentation for better few-short learning (see ¶ 116, ¶ 169-171).

Miller, Noyes and Jackson does not explicitly disclose the following limitations; however, Tangari in an analogous art for augmenting training data discloses

the metadata to be used to augment training data for a neural database (see Abstract; ¶ 2, ¶ 7-9, claims 1 and 15);

train the neural database based on the augmented training data, the neural database comprising a neural network (NN)-based system that is trained to retrieve a predicted list of one or more second entities that supply materials for the first entity and associated with the good or the service (see ¶ 13, ¶ 32, ¶ 132, ¶ 158, ¶ 171-73, claims 7-8).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes and Jackson to include teaching of Tangari in order to gain the commonly understood benefit of such adaption, such as providing the benefit of additional of data analysis, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

In addition, phrase(s) of "the metadata to be used to augment training data for a neural database" the use of the metadata is directed to intended use language and is not given patentable weight. If Applicant desires to given the functional phrase(s) a greater patentable weight, the Examiner respectfully recommends Applicant to positively recite the function in the claim.

Regarding claim 10, Miller discloses the element set comprises one or more expected attribute-value pairs based on document structure (see ¶ 121, ¶ 208).

Miller does not explicitly disclose the following limitations; however, Noyes discloses the processing system of Claim 9, wherein: the structured entity data comprises a plurality of key

and value pairs associated with the first entity, at least one of the plurality of key and value pairs comprises an entity name, and at least one of the plurality of key and value pairs comprises the good or the service provided by the first entity (see ¶ 87, ¶ 165-168). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 11, Miller does not explicitly disclose the following limitations; however, Noyes discloses the processing system of Claim 10, wherein the metadata associated with the structured entity data comprises a plurality of key and value pairs associated with the materials associated with the good or the service provided by the first entity (see ¶ 15, ¶ 87). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 12, Miller does not explicitly disclose the following limitations, however, Noyes discloses the processing system of Claim 11, wherein the processor is further configured to cause the processing system to score each respective key and value pair of the plurality of key and value pairs associated with the materials based on one or more of:

a frequency with which the first entity obtains each material of the materials (see ¶ 60-61, ¶ 166-168, ¶ 174-175), or

a criticality of each material of the materials to the first entity for providing the good or the service.

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 13, Miller does not explicitly disclose the following limitations, however, Noyes discloses the processing system of Claim 12, wherein to cause the processing system to score each respective key and value pair, the processor is configured to cause the processing system to score each respective key and value pair based on a preference derived from one or more of historical data or user settings (see ¶ 40, ¶ 51-52, ¶ 181). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 15, Miller discloses the processing system of Claim 9, wherein the processor is further configured to cause the processing system to:

perform reinforcement learning to refine the neural database, wherein the reinforcement learning is based on a user interaction with a query result generated by the neural database (see ¶ 161-162, ¶ 383).

Regarding claim 16, Miller discloses the processing system of Claim 9, wherein the processor is further configured to cause the processing system to:

process a user query with the trained neural database to generate one or more query results, wherein the one or more query results relate to the predicted list of the one or more second entities that supply the materials associated with the good or the service provided by the first entity (see Abstract; ¶ 84, ¶ 118, ¶ 121, ¶ 124).

Regarding claim 17, Miller discloses a computer-implemented method, comprising:

receiving, via a user interface, a user query to determine one or more second entities that supply materials associated with a good or a service provided by a first entity (see ¶ 201-203, ¶ 230-231);

receiving, from the neural database, an output comprising the predicted list of the one or more second entities (see ¶ 57, ¶ 231); and

sending the output to the user interface to cause an action via the user interface (see ¶ 201-202, ¶ 312, ¶ 366).

Miller discloses processing the large amounts of data associated with a worldwide collection of product-related records associated with different entities (see ¶ 13).

Miller does not explicitly disclose a first entity and a second entity; however, Noyes in an analogous for identifying consumers associated with behavior data discloses

data includes first data received from a first plurality of entities of a first community and second data received from a second plurality of entities of a second community (see ¶ 14).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function

as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Miller discloses training a neural network (NN) using a specialized training dataset corresponding to the type of specialized corpora product-related/relevant information to generate alternative queries from queries (or perform such tasks); and the NNs has exhibit significant language processing capabilities, similar to any of the performance characteristics known with respect to learning neural network system, self-training with task augmentation for better few-short learning (see ¶ 116, ¶ 169-171).

Miller, Noyes and Jackson does not explicitly disclose the following limitations; however, Tangari in an analogous art for augmenting training data discloses

processing the user query with a neural database comprising a neural network (NN)-based system that is trained, based on augmented training data, to retrieve a predicted list of the one or more second entities that supply the materials associated with the good or the service provided by the first entity (see ¶ 13, ¶ 32-33, ¶ 132, ¶ 158, ¶ 171-73, claims 7-8), the augmented training data comprising metadata used to augment training data for the neural database (see Abstract; ¶ 2, ¶ 7-9, claims 1 and 15).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes and Jackson to include teaching of Tangari in order to gain the commonly understood benefit of such adaption, such as providing the benefit of additional of data analysis, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

In addition, phrase(s) of "the augmented training data comprising metadata used to augment training data for the neural database" the use of the metadata is directed to intended use language and is not given patentable weight. If Applicant desires to given the functional

phrase(s) a greater patentable weight, the Examiner respectfully recommends Applicant to positively recite the function in the claim.

Regarding claim 18, Miller discloses the element set comprises one or more expected attribute-value pairs based on document structure (see ¶ 121, ¶ 208).

Miller does not explicitly disclose the following limitations; however, Noyes discloses the computer-implemented method of Claim 17, wherein:

the augmented training data comprises structured entity data comprising a plurality of key and value pairs associated with the first entity (see ¶ 87), wherein:

at least one of the plurality of key and value pairs comprises an entity name, and at least one of the plurality of key and value pairs comprises the good or the service provided by the first entity (see ¶ 165-166), and

the metadata is associated with the structured entity data (see ¶ 15, ¶ 87).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller to include teaching of Noyes in order to gain the commonly understood benefit of such adaption, such as providing the benefit of a more specific data analysis, resulting in more focused solution, enabling better decision making. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 19, Miller discloses the computer-implemented method of Claim 17, wherein: the received output further comprises priority data associated with the one or more second entities, and causing the action via the user interface comprises:

determining a subset of the one or more second entities based on the priority data; and

generating one or more personalized messages to contact the subset of the one or more second entities (see ¶ 12, ¶ 54, ¶ 202).

Regarding claim 20, Miller discloses the computer-implemented method of Claim 19, wherein generating the one or more personalized messages comprises generating the one or more personalized messages by prompting a machine learning model to generate the one or more personalized messages (see ¶ 12, ¶ 46, ¶ 261).

14. **Claims 6 and 14** are rejected under 35 U.S.C. 103 as being unpatentable over Miller and in view of Noyes, Jackson and Tangari as applied to claims 1-5, 7-13 and 15-20 above, and further in view of Patel et al., (US 2022/0382785, hereinafter: Patel).

Regarding claim 6, Miller discloses a weighted sum and a weighting factor applied for frequency of occurrences (see Fig. 24, # 1460; ¶ 164, ¶ 414).

Miller, Noyes and Jackson do not explicitly disclose the following limitations; however, Patel discloses the computer-implemented method of Claim 4, wherein scoring each respective key and value pair comprises determining a weighted sum of a frequency score and a criticality score for each respective material of the materials (see ¶ 32, ¶ 88), wherein:

the frequency score is based on a number of procurement transactions for the respective material within a configured time period (see ¶ 26, ¶ 93, ¶ 111), and

the criticality score is based on one or more of historical data or user settings (see Abstract; ¶ 4, ¶ 25-32, ¶ 93).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes and Jackson to include teaching of Patel in order to gain the commonly understood benefit of such adaption, such as providing the benefit of enhancing computational efficiency, and in turn operational efficiency. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 14, Miller, Noyes and Jackson do not explicitly disclose the following limitations, however, Patel discloses the processing system of Claim 12, wherein to cause the processing system to score each respective key and value pair, the processor is configured to cause the processing system to determine a weighted sum of a frequency score and a criticality score for each respective material of the materials, wherein:

the frequency score is based on a number of procurement transactions for the respective material within a configured time period (see ¶ 26, ¶ 93, ¶ 111), and

the criticality score is based on one or more of historical data or user settings (see Abstract; ¶ 4, ¶ 25-32, ¶ 93).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Miller and in view of Noyes and Jackson to include teaching of Patel in order to gain the commonly understood benefit of such adaption, such as providing the benefit of enhancing computational efficiency, and in turn operational efficiency. Since the combination of each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Ben-Itzhak et al., (US 2022/0012535) discloses a method for augmenting training data sets for machine learning classifiers using classification metadata and augmenting the training data set with the classification metadata to create an augmented version of the training data set.

- James et al., (JP 2022119207) discloses a method for extracting vaccination data from a document and verifying the data and performing natural language processing on the document data to generate processed document data.

- Wilson et al., (US 2024/0037583) discloses a system for generating a predictive model during training of a machine learning program using a training data set to generate predictive survey data with respect to second user by correlating a personal data set of the second user to the personal data set of at least one of the first users.

- Deshpande et al., (WO 2021244657) discloses a system for acquiring target entity information by extracting from a data source of an associated entity information corresponding to the target entity and relationship information between the target entity information and the associated entity information.

- Rabelo et al., " Analysis of Supply Chains Using System Dynamics, Neural Nets, and Eigenvalues", Industrial Engineering and Management Systems Dept. University of Central Florida, Orlando, FL. U.S.S. Proceedings of the 2004 Winter Simulation Conference R.G. Ingalls, M. D. Rossetti, J. S. Smith, and B. A. Peters, eds.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any nonprovisional extension fee (37 CFR 1.17(a)) pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAN CHOY whose telephone number is (571)270-7038. The examiner can normally be reached 5/4/9 compressed work schedule.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry O'Connor can be reached on 571-272-6787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/PAN G CHOY/
Primary Examiner, Art Unit 3624